# 1 INTRODUCTION

This Engineering Design Report describes the remedial design for cleanup of two polychlorinated biphenyl (PCB) sediment deposits denoted the Upriver Dam PCB Sediment Site (the site) located in Spokane County, Washington (Figure 1). Cleanup requirements at the site are more specifically described in the Consent Decree (CD) executed in August 2005 between the Washington State Department of Ecology (Ecology) and Avista Development, Inc. (Avista), which is included as an exhibit to the Final Cleanup Action Plan (CAP) prepared by Ecology for the site (Ecology 2005). Remedial design/remedial action (RD/RA) activities will be performed in compliance with the Washington Administrative Code (WAC), Washington's Sediment Management Standards (SMS) (Ecology 1995a; WAC 173-204), and the Model Toxics Control Act (MTCA) (Ecology 2001; WAC 173-340).

The work to be performed will also be consistent with the United States Environmental Protection Agency's (EPA's) September 2002 Record of Decision (ROD) for heavy metal contamination in the Coeur d'Alene Basin and Spokane River (EPA 2002). The CD and Final CAP do not provide complete remedies for contaminants other than PCBs identified within the Upriver Dam area. Rather, cleanup actions described in the CD, Final CAP, and this report are designed to mitigate risks associated with sediments containing PCBs and incidentally co-located contaminants. Heavy metal contamination in the upper reaches of the river and proposed remedial activities are discussed in the ROD. EPA is the lead agency responsible for the remediation of heavy metals originating in the Coeur d'Alene Basin and deposited in the sediments behind the Upriver Dam and elsewhere.

This report presents a concise narrative discussion of performance standards and the cleanup remedy design, and how the remedy meets standard professional engineering practices at the two PCB sediment deposits:

- Deposit 1 near Upriver Dam (Deposit 1)
- Deposit 2 near Donkey Island (Deposit 2)

## 1.1 Previous Investigations

As described in the Final CAP, multiple physical and chemical analysis surveys have been performed on the sediments deposits. These investigations include:

- Ecology's 1993-94 investigations (Ecology 1995b)

- Kaiser's 1994 Investigations (Hart Crowser 1995)
- Ecology's 1999 Survey (Johnson 2000)
- Ecology's 2000 Sediment Toxicity Tests (Johnson and Norton 2001)
- EPA's 2001 Coeur d'Alene Basin Remedial investigation/Feasibility Study (EPA 2001)
- Avista's and Kaiser's 2001 Investigation (Exponent and Anchor 2001)
- Avista and Kaiser's 2005 Focused Remedial Investigation Report (Anchor 2005a)
- Avista and Kaiser's 2005 Focused Feasibility Study (Anchor 2005b)

These events were analyzed to complete a characterization of the nature and extent of the PCB sediment contamination. Ecology selected 62 micrograms per kilometers (μg/Kg) total PCBs in the sediment as the cleanup level that will be protective of human health and the river ecological community. The remedy includes the placement of a minimum 13-inch cap over the identified PCB contaminated sediments at Deposit 1. For Deposit 2, the selected remedy includes excavation of two smaller deposits that contain PCB concentrations greater than 62 μg/Kg total PCBs, followed by the backfill of clean material to restore the site to its pre-construction conditions.

## 1.2 Description of PCB Deposits

### *1.2.1 Deposit 1*

This fine-grained sediment deposit (Figure 2) is located within approximately 3.6 acres of the 17-acre Upriver Dam impoundment. Deposit 1 consists of relatively fine-grained (i.e., silty sand) and wood waste materials that have accumulated within deeper, lower energy portions of the former Spokane River channel immediately above Upriver Dam. Data collected during previous investigations indicate that PCB levels peak at depths well below the sediment surface, and PCB concentrations decrease steadily in shallower intervals.

### *1.2.2 Deposit 2*

Located within an emergent wetland area within Spokane River north bank side channels near Donkey Island (River Mile [RM] 83.4), Deposit 2 (Figure 3) consists of fine-grained deposits of sediment that have come to reside in backwater channels in the Donkey Island area. These silty sand deposits overlie larger riverine materials (i.e.,

gravel and cobble) in these channels and are confined to low energy depositional areas. Deposit 2 is a relatively small area (approximately 0.25 acres) containing sediments with elevated PCB concentrations. The Deposit 2 area is characterized by a highly heterogeneous environment consisting of areas that are seasonally inundated as well as channels that have standing water throughout the year.

## 1.3 Report Organization

The report was completed in general conformance with WAC 173-340-400. The report is organized in the following sections:

- **Section 2 – Details of Deposit 1 Remediation**. This section presents the design, engineering analysis, and anticipated construction approach for Deposit 1.
- **Section 3 – Details of Deposit 2 Remediation**. This section presents the design, engineering analysis, and anticipated construction approach for Deposit 2.
- **Section 4 – Compliance Monitoring**. This section presents an overview of monitoring that will occur both during and after construction.
- **Section 5 – Construction Schedule.**
- **Appendix A** contains the draft final project design drawings.
- **Appendix B** presents the Construction Quality Assurance Project Plan (CQAP).
- **Appendix C** presents the Operations, Maintenance, and Monitoring Plan (OMMP) including any institutional controls.
- **Appendix D** presents Sampling and Analysis Plan (SAP) that accompanies the OMMP.

Also accompanying this report as a separate submittal are the draft final design specifications.